

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Orass et al.

Serial No: To be assigned

Filed: N/A

For: CATALYST COMPOSITION FOR  
POLYMERIZATION OLEFINS TO  
MULTIMODAL MOLECULAR WEIGHT  
DISTRIBUTION POLYMER, PROCESS  
FOR PRODUCTION AND USE OF  
THE CATALYST

CERTIFICATE OF EXPRESS MAILING

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Date: January 18, 2002

Express Mail No EL781125679 US

Name: William Spatz

Signature: William Spatz

Prior U.S. Application:

In re Application of: Orass et al.

Examiner: W. Cheung

Serial No.: 09/399,305

Attorney Docket No. 180577-00080

Filed: September 17, 1999

Group Art Unit: 1713

For: CATALYST COMPOSITION FOR POLYMERIZING OLEFINS TO  
MULTIMODAL MOLECULAR WEIGHT DISTRIBUTION  
POLYMER, PROCESS FOR PRODUCTION AND USE OF THE  
CATALYST

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BOX PATENT APPLICATION

Commissioner for Patents

Washington, DC 20231

PRELIMINARY AMENDMENT

Sirs:

Prior to calculating the filing fee and examination, please amend the above-identified application as follows:

Pursuant to revised 37 C.F.R. § 1.21, a clean form of the claims, as amended hereby, is set forth below. The within amendments to the claims are also identified in a marked-up version of the same attached hereto as Exhibit A, with all changes shown by a conventional comparison system.

IN THE CLAIMS:

Please cancel original claims 1-22 of the prior application and amend the remaining claims to conform to the claims set forth below. Claims amended by the instant Preliminary Amendment are identified by the word Amended after the claim number.

23. (Amended) A process for olefin polymerization comprising contacting an olefin with a catalyst composition comprising (A) a solid catalyst component comprising a transition metal-containing metallocene compound, a transition metal-containing non-metallocene compound, a magnesium compound and a polymeric support material, and (B) a cocatalyst comprising an aluminum compound, said contacting occurring under conditions sufficient for the production of olefin polymers.

24. The process of Claim 23 wherein the olefin polymers comprise homopolymers of olefins or copolymers of olefins and alpha olefins.

25. The process of Claim 24 wherein the olefin polymers are multimodal.

26. (Amended) A process for preparing an olefin polymerization catalyst composition comprising combining support polymer particles, a magnesium compound, a transition metal-containing metallocene compound, and a transition metal-containing non-metallocene compound, to provide a solid catalyst component, and combining the solid catalyst component with a cocatalyst compound to provide an olefin polymerization catalyst composition.

27. (Amended) The process of Claim 26 wherein the solid catalyst component is substantially free of aluminum before combination with said cocatalyst compound.

Please add the following new claims:

28. The catalyst composition of Claim 23 wherein the metallocene compound is represented by the general formula  $(Cp)_zMR_wX_y$  wherein Cp represents unsubstituted or substituted cyclopentadienyl ring, M represents a Group IVB or VB transition metal, R represents a hydrocarbyl group containing 1 to 20 carbon atoms, X represents a halogen atom, and  $1 \leq z \leq 3$ ,  $0 \leq w \leq 3$ ,  $0 \leq y \leq 3$ .

29. The catalyst composition of Claim 28 wherein the metallocene compound is bis(cyclopentadienyl)zirconium methyl chloride, bis(cyclopentadienyl)zirconium dichloride, bis(cyclopentadienyl)titanium methyl chloride or bis(cyclopentadienyl)titanium dichloride.

30. The process of claim 23 wherein the polymer particles have a mean particle diameter of 5  $\mu m$  to 1000  $\mu m$ , a pore volume of at least 0.1  $cm^3/g$  and a surface area of from 0.2  $m^2/g$  to 15  $m^2/g$ .

31. The process of Claim 30 wherein the polymer particles comprise polyolefins, polyvinylchloride, polyvinylalcohol or polycarbonate.

32. The process of Claim 31 wherein the polymer particles are polyvinylchloride.

33. The catalyst composition of Claim 32 wherein the polyvinylchloride particles are spherical in shape.

34. The process of claim 23 wherein the non-metallocene compound comprises titanium tetrachloride, zirconium tetrachloride and/or vanadium tetrachloride.

35. The process of Claim 34 wherein Ti and Zr are present in the composition in a molar ratio of Ti to Zr of about 3:1 to about 30:1.

36. The process of Claim 29 wherein the magnesium compound comprises diethylmagnesium, dibutylmagnesium, butylethylmagnesium, dihexylmagnesium, butyloctylmagnesium, ethylmagnesium chloride, butylmagnesium chloride, hexylmagnesium chloride or mixtures thereof.

37. The process of Claim 36 wherein the cocatalyst (B) aluminum compound is represented by the general formulas  $R_n^6 AlX_{3-n}$  and  $R^7 R^8 Al-O-AlR^9_2$ , wherein  $R^6$ ,  $R^7$ ,  $R^8$  and  $R^9$  each independently represent a hydrocarbyl group having 1 to 10 carbon atoms; X represents a halogen atom and n represents a number satisfying  $0 \leq n \leq 3$ .

38. The process of Claim 37 wherein the cocatalyst (B) aluminum compound comprises a mixture of trialkylaluminum and an alkyl alumoxane.

39. The process of Claim 26, wherein the metallocene compound is represented by the general formula  $(Cp)_z MR_w X_y$  wherein Cp represents unsubstituted or substituted cyclopentadienyl ring, M represents a Group IVB or VB transition metal, R represents a hydrocarbyl group containing 1 to 20 carbon atoms, X represents a halogen atom, and  $1 \leq z \leq 3$ ,  $0 \leq w \leq 3$ ,  $0 \leq y \leq 3$ .

40. The process of Claim 39 wherein the polymer particles have a mean particle diameter of 5  $\mu m$  to 1000  $\mu m$ , a pore volume of at least 0.1  $cm^3/g$  and a surface area of from 0.2  $m^2/g$  to 15  $m^2/g$ .

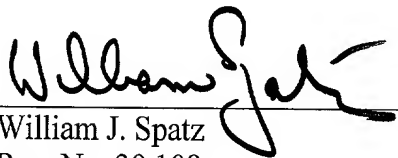
41. The process of Claim 40 wherein the polymer particles are comprised of polyvinylchloride and are spherical in shape.

42. The process of Claim 41, wherein the magnesium compound comprises diethylmagnesium, dibutylmagnesium, butylethylmagnesium, dihexylmagnesium, butyloctylmagnesium, ethylmagnesium chloride, butylmagnesium chloride, hexylmagnesium chloride or mixtures thereof.

Early and favorable consideration of claims 23-42 is earnestly solicited.

Dated: January 18, 2002

By:



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**EXHIBIT A**

**Marked Claims Showing Amendments**

23. (Amended) A process for olefin polymerization comprising contacting [said] an olefin with a catalyst composition comprising (A) a solid catalyst component comprising a transition metal-containing metallocene compound, a transition metal-containing non-metallocene compound, a magnesium compound and a polymeric support material, and (B) a cocatalyst comprising an aluminum compound, said contacting occurring under conditions sufficient for the production of olefin polymers.

24. The process of Claim 23 wherein the olefin polymers comprise homopolymers of olefins or copolymers of olefins and alpha olefins.

25. The process of Claim 24 wherein the olefin polymers are multimodal.

26. (Amended) A process for preparing an olefin polymerization catalyst composition [comprises] comprising combining support polymer particles, magnesium compound, transition metal-containing metallocene compound, and transition metal-containing non-metallocene compound, to provide a solid catalyst component, and combining the solid catalyst component with cocatalyst compound to provide an olefin polymerization catalyst composition.

27. The process of Claim 25 wherein the solid catalyst component is prepared in substantial absence of aluminum compound before combining with said cocatalyst compound.

28. The catalyst composition of Claim 23 wherein the metallocene compound is represented by the general formula  $(Cp)_zMR_wX_y$  wherein Cp represents unsubstituted or substituted cyclopentadienyl ring, M represents a Group IVB or VB transition metal, R

represents a hydrocarbly group containing 1 to 20 carbon atoms, X represents a halogen atom, and  $1 \leq z \leq 3$ ,  $0 \leq w \leq 3$ ,  $0 \leq y \leq 3$ .

29. The catalyst composition of Claim 28 wherein the metallocene compound is bis(cyclopentadienyl)zirconium methyl chloride, bis(cyclopentadienyl)zirconium dichloride, bis(cyclopentadienyl)titanium methyl chloride or bis(cyclopentadienyl)titanium dichloride.

30. The process of claim 23 wherein the polymer particles have a mean particle diameter of 5  $\mu\text{m}$  to 1000  $\mu\text{m}$ , a pore volume of at least 0.1  $\text{cm}^3/\text{g}$  and a surface area of from 0.2  $\text{m}^2/\text{g}$  to 15  $\text{m}^2/\text{g}$ .

31. The process of Claim 30 wherein the polymer particles comprise polyolefins, polyvinylchloride, polyvinylalcohol or polycarbonate.

32. The process of Claim 31 wherein the polymer particles are polyvinylchloride.

33. The catalyst composition of Claim 32 wherein the polyvinylchloride particles are spherical in shape.

34. The process of claim 23 wherein the non-metallocene compound comprises titanium tetrachloride, zirconium tetrachloride and/or vanadium tetrachloride.

35. The process of Claim 34 wherein Ti and Zr are present in the composition in a molar ratio of Ti to Zr of about 3:1 to about 30:1.

36. The process of Claim 29 wherein the magnesium compound comprises diethylmagnesium, dibutylmagnesium, butylethylmagnesium, dihexylmagnesium, butyloctylmagnesium, ethylmagnesium chloride, butylmagnesium chloride, hexylmagnesium chloride or mixtures thereof.

37. The process of Claim 36 wherein the cocatalyst (B) aluminum compound is represented by the general formulas  $R^6_n AlX_{3-n}$  and  $R^7R^8Al-O-AlR^9_2$ , wherein  $R^6$ ,  $R^7$ ,  $R^8$  and  $R^9$  each independently represent a hydrocarbyl group having 1 to 10 carbon atoms; X represents a halogen atom and n represents a number satisfying  $0 \leq n \leq 3$ .

38. The process of Claim 37 wherein the cocatalyst (B) aluminum compound comprises a mixture of trialkylaluminum and an alkyl alumoxane.

39. The process of Claim 26, wherein the metallocene compound is represented by the general formula  $(Cp)_zMR_wX_y$  wherein Cp represents unsubstituted or substituted cyclopentadienyl ring, M represents a Group IVB or VB transition metal, R represents a hydrocarbyl group containing 1 to 20 carbon atoms, X represents a halogen atom, and  $1 \leq z \leq 3$ ,  $0 \leq w \leq 3$ ,  $0 \leq y \leq 3$ .

40. The process of Claim 39 wherein the polymer particles have a mean particle diameter of 5  $\mu m$  to 1000  $\mu m$ , a pore volume of at least 0.1  $cm^3/g$  and a surface area of from 0.2  $m^2/g$  to 15  $m^2/g$ .

41. The process of Claim 40 wherein the polymer particles are comprised of polyvinylchloride and are spherical in shape.

42. The process of Claim 41, wherein the magnesium compound comprises diethylmagnesium, dibutylmagnesium, butylethylmagnesium, dihexylmagnesium, butyloctylmagnesium, ethylmagnesium chloride, butylmagnesium chloride, hexylmagnesium chloride or mixtures thereof.